

Hepatitis B in Denver County, Colorado 2008-2013 Epidemiological Profile Report

Cases of Acute and Chronic Hepatitis B in Denver County

Note: This report is published by the Viral Hepatitis Program (VHP), Disease Control and Environmental Epidemiology Division, Colorado Department of Public Health and Environment, Denver Colorado. Data are presented for acute and chronic hepatitis B cases reported to CDPHE from 2008-2013



Colorado Department
of Public Health
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Denver County is located in northeast Colorado with an estimated population of 648,926 in 2013.¹ The median age in Denver County is 34. The median household income is \$47,499, and the county poverty rate is 14%, compared to 19% for the region.² There are 263,107 households in Denver County with the majority being single households (41%), married with no children (19%), and married with children (15%), and age 65 and older living alone households (10%).² The leading occupation by industry in Denver County is Business, Science, and Arts (41%) and Sales and Office work (24%). According to the United States Census, the largest ethnic group in the county are White 53.4%, followed by Hispanic or Latino 30.9%, Black or African American 10.2%, Asian 3.8%, two or more races 3.1%, American Indian and Alaska Native 2.0%, and Native Hawaiian and Other Pacific Islander 0.2%.³ The data in this report is current as of December 31, 2014. The state database is constantly being updated as lab reports are received and new cases are confirmed or deleted.

Hepatitis B in Denver County

Table 1: Reported Hepatitis B Cases by Case Status, Gender, Age, and Race: Denver County, 2013

	Acute HBV Cases		Chronic HBV Cases †		All HBV Cases	
	Number	Percent of Total	Number	Percent of Total	Total	Rate of Reported Cases/ 100,000 ‡
Total (State)	26	100%	511	100%	537	10.2
Total (Denver)	7	26.9%	81	15.9%	88	13.6
Case Status (State)						
Confirmed	5	71.4%	20	24.7%	25	3.9
Probable	2	14.3%	61	75.3%	63	9.7
Suspect	0	0.0%	0	0.0%	0	0.0
Gender (Denver)						
Female	1	14.3%	34	42.0%	35	5.4
Male	6	85.7%	47	58.0%	53	8.2
Unknown	0	0.0%	0	0.0%	0	0.0
Age (years)						
0-9	0	0.0%	1	1.2%	1	0.2
10-19	0	0.0%	5	6.2%	5	0.8
20-29	0	0.0%	18	22.2%	18	2.8
30-39	1	14.3%	25	30.9%	26	4.0
40-49	4	57.1%	10	12.3%	14	2.2
50-59	1	14.3%	12	14.8%	13	2.0
60+	1	14.3%	10	12.3%	11	1.7

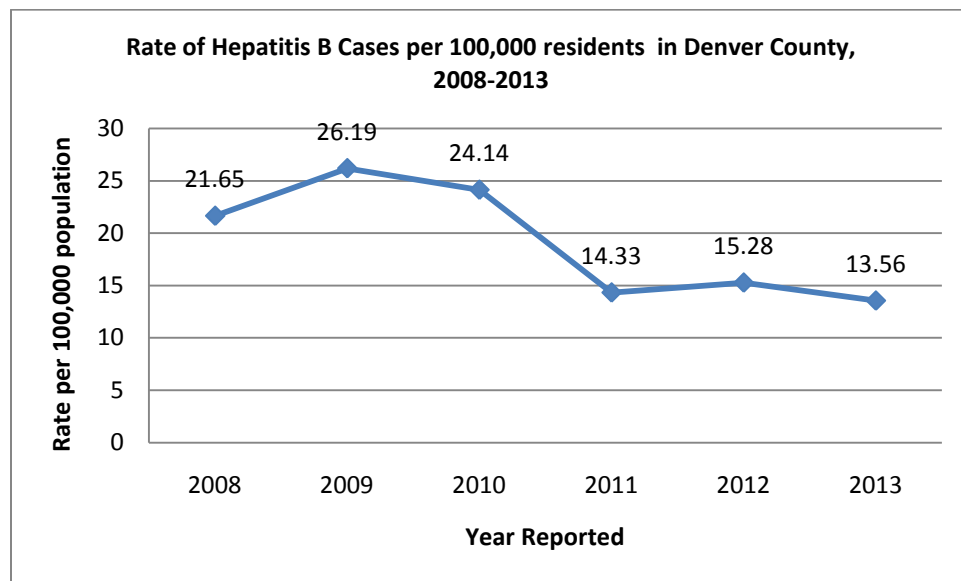
Unknown	0	0.0%	0	0.0%	0	0.0
Race/Ethnicity						
Hispanic	2	28.6%	3	3.7%	5	0.8
White non-						
Hispanic	3	42.9%	11	13.6%	14	2.2
Black non-						
Hispanic	1	14.3%	15	18.5%	16	2.5
American						
Indian	0	0.0%	0	0.0%	0	0.0
Asian/Pacific						
Islander	0	0.0%	28	34.6%	28	4.3
Multiple	0	0.0%	0	0.0%	0	0.0
Other/Missing/						
Unknown	1	14.3%	24	29.6%	25	3.9

Table 2: Reported Hepatitis B Cases by Case Status, Gender, Age, and Race: Denver County, 2008-2013

	Acute HBV Cases		Chronic HBV Cases †		All HBV Cases	
	Number	Percent of Total	Number	Percent of Total	Total	Rate of Reported Cases/ 100,000 ‡
Total (State)	201	100%	3178	100%	3379	11.1
Total (Denver)	49	24.4%	663	20.9%	712	19.3
Case Status (State)						
Confirmed	42	85.7%	262	39.5%	304	8.2
Probable	6	12.2%	400	60.3%	406	11.0
Suspect	1	2.0%	1	0.2%	2	0.1
Gender (Denver)						
Female	9	18.4%	280	42.2%	289	7.8
Male	40	81.6%	383	57.8%	423	11.5
Unknown	0	0.0%	0	0.0%	0	0.0
Age (years)						
0-9	0	0.0%	4	0.6%	4	0.1
10-19	0	0.0%	30	4.5%	30	0.8
20-29	5	10.2%	165	24.9%	170	4.6
30-39	9	18.4%	183	27.6%	192	5.2
40-49	20	40.8%	102	15.4%	122	3.3
50-59	11	22.4%	89	13.4%	100	2.7
60+	4	8.2%	90	13.6%	94	2.5
Unknown	0	0.0%	0	0.0%	0	0.0
Race/Ethnicity						

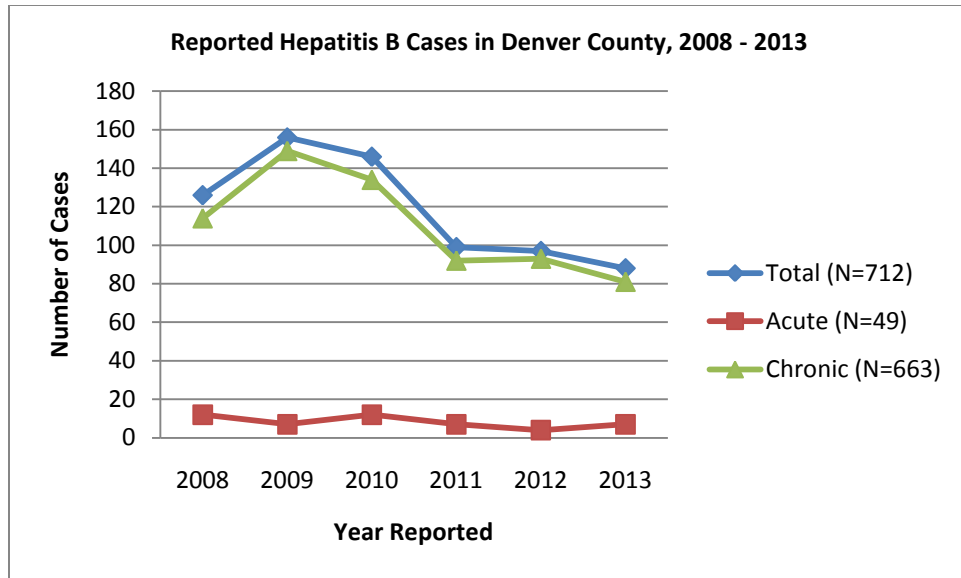
Hispanic	10	20.4%	28	4.2%	38	1.0
White non-Hispanic	26	53.1%	95	14.3%	121	3.3
Black non-Hispanic	9	18.4%	142	21.4%	151	4.1
American Indian	2	4.1%	1	0.2%	3	0.1
Asian/Pacific Islander	1	2.0%	249	37.6%	250	6.8
Multiple	0	0.0%	0	0.0%	0	0.0
Other/Missing/Unknown	1	2.0%	148	22.3%	149	4.0

Data is current as of 12/31/2014.



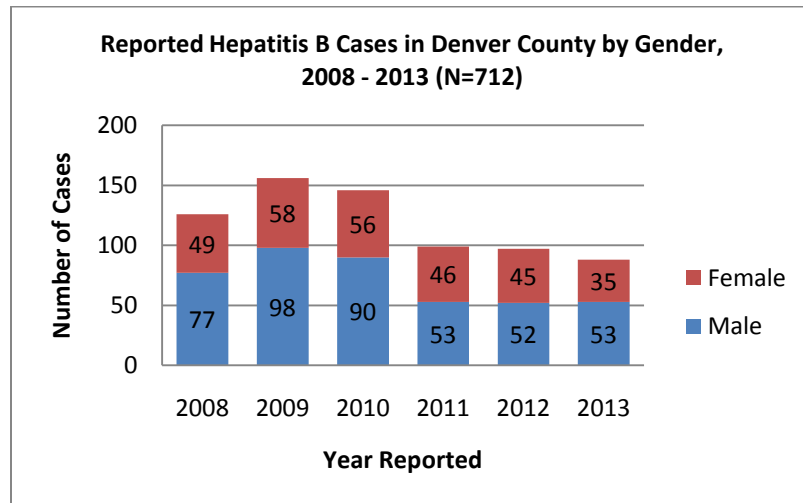
Data is current as of 12/31/2014.

Figure 1. The number of reported Hepatitis B cases in Denver County, 2008-2013



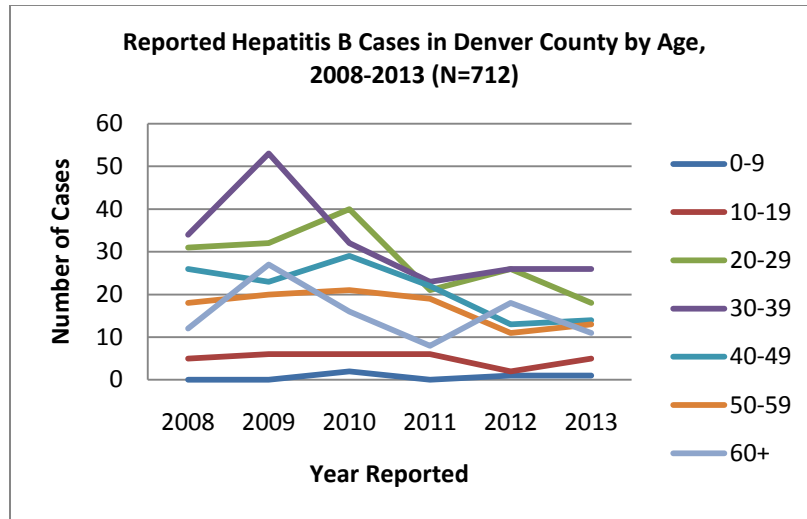
Data is current as of 12/31/2014.

Figure 2. The rate of Hepatitis B cases in Denver County, 2008-2013



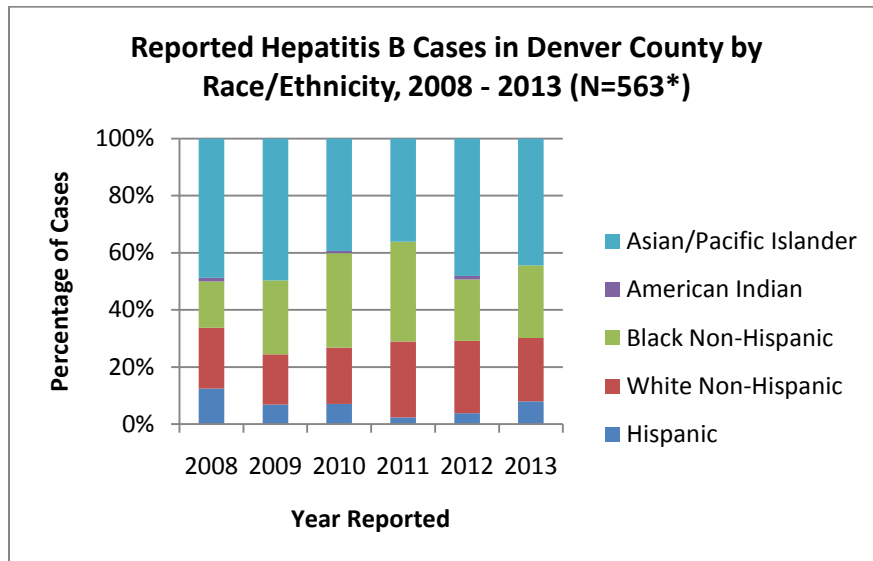
Data is current as of 12/31/2014.

Figure 3. The gender of reported Hepatitis B cases in Denver County, 2008-2013



Data is current as of 12/31/2014.

Figure 4. The age of reported Hepatitis B cases in Denver County, 2008-2013



Data is current as of 12/31/2014.

Figure 5. The race/ethnicity of reported Hepatitis B cases in Denver County, 2008-2013

Table3: Reported Hepatitis B Cases by Risk Factor, and Percentage of Cases Reporting the Risk Factor: Denver County, 2013+

	Acute HBV Cases		Chronic HBV Cases †		All HBV Cases
	Number	Percent of Total	Number	Percent of Total	Total
Total	7		81		88
IVDU					
Yes	0	0.0%	4	4.9%	4
No	6	85.7%	5	6.2%	11
Unknown	0	0.0%	2	2.5%	2
Missing	1	14.3%	70	86.4%	71
Household Contact					
Yes	0	0.0%	1	1.2%	1
No	5	71.4%	4	4.9%	9
Unknown	2	28.6%	1	1.2%	3
Missing	0	0.0%	75	92.6%	75
Sex Contact					
Yes	1	14.3%	1	1.2%	2
No	4	57.1%	4	4.9%	8
Unknown	2	28.6%	1	1.2%	3
Missing	0	0.0%	75	92.6%	75
Baby Boomer					
Yes	2	28.6%	22	27.2%	24
No	5	71.4%	59	72.8%	64
Born in Endemic Area					
Yes	0	0.0%	41	50.6%	41
No	7	100.0%	12	14.8%	19
Unknown	0	0.0%	5	6.2%	5
Missing	0	0.0%	23	28.4%	23
MSM					
Yes	3	42.9%	2	2.5%	5
No	2	28.6%	1	1.2%	3
Unknown	1	14.3%	5	6.2%	6
Missing	1	14.3%	73	90.1%	74

Data is current as of 12/31/2014.

†Risk factor categories are not mutually exclusive.

Table 4: Reported Hepatitis B Cases by Risk Factor, and Percentage of Cases Reporting the Risk Factor: Denver County, 2008 - 2013†

	Acute HBV Cases		Chronic HBV Cases †		All HBV Cases
	Number	Percent of Total	Number	Percent of Total	Total
Total	49		663		712
IVDU					
Yes	7	14.3%	23	3.5%	30
No	31	63.3%	113	17.0%	144
Unknown	5	10.2%	321	48.4%	326
Missing	6	12.2%	206	31.1%	212
Household Contact					
Yes	1	2.0%	8	1.2%	9
No	27	55.1 %	266	40.1%	293
Unknown	13	26.5%	183	27.6%	196
Missing	8	16.3%	206	31.1%	214
Sex Contact					
Yes	1	2.0%	7	1.1%	8
No	27	55.1 %	267	40.3%	294
Unknown	13	26.5%	183	27.6%	196
Missing	8	16.3%	206	31.1%	214
Baby Boomer					
Yes	22	44.9%	194	29.3%	216
No	27	55.1%	469	70.7%	496
Born in Endemic Area					
Yes	2	4.1%	339	51.1%	341
No	45	91.8%	84	12.7%	129
Unknown	2	4.1%	92	13.9%	94
Missing	0	0.0%	148	22.3%	148
MSM					
Yes	20	40.8%	93	14.0%	113
No	13	26.5%	12	1.8%	25
Unknown	9	18.4%	344	51.9%	353
Missing	7	14.3%	214	32.3%	221

Data is current as of 12/31/2014.

†Risk factor categories are not mutually exclusive.

Technical Notes Hepatitis B Surveillance

Viral hepatitis surveillance in Colorado is primarily based on laboratory reporting. The Colorado Board of Health requires physicians and other health care providers to report suspected cases of hepatitis B virus (HBV) within 7 days, and it requires laboratories to report HBV serologic tests that are indicative of infection within 7 days. Upon receipt of these reports, either electronically, by fax, or via another reporting system, the Viral Hepatitis Program (VHP) uses established case definitions to assign a diagnosis and case status for each patient. Data is entered into the Colorado Electronic Disease Reporting System where it is available to local or state public health personnel for further investigation of cases. If a variable is reported as missing, the information was not located by the disease investigators. If the variable is reported as unknown, then the investigator asked the question or located the information in a report and it was marked unknown. For example, a case investigator reviewed a medical record for a case and found a question related to race that was not marked. In that case, the variable was “missing”. If a person did not know whether or not their household contacts had hepatitis B, they would respond “don’t know” or “unknown”. Hepatitis B vaccination became a school entry requirement in 1997. At that time, the Colorado Board of Health required all day care students age fifteen months through four years of age, kindergarten and seventh grade students to have had three doses of hepatitis B vaccine to attend school. A 12-year old student entering seventh grade in 1997 would have been born in 1985 and be 27 years of age in 2012.

Acute Hepatitis B

Acute hepatitis B is a short-term illness that occurs within the first six months of infection with HBV. Symptoms are usually mild to moderate, and include fatigue, nausea, vomiting, abdominal pain, jaundice and abnormal liver function tests. Older children and adults are more likely to develop symptoms than younger children. The hepatitis B IgM can be detected in sera and used as a marker of acute infection. CDPHE used case definitions published by the National Notifiable Diseases Surveillance System (NNDSS) to define an acute case. These can be found at:

<http://wwwn.cdc.gov/NNDSS/script/conditionsummary.aspx?CondID=80>

Chronic Hepatitis B

Chronic hepatitis B results when HBV remains in the body after the acute phase of illness. People with a chronic infection do not develop protective antibodies to the hepatitis B surface antigen. Among those infected, 30-50% of younger children (aged 1-4 years), and up to 90% of infants will develop chronic hepatitis B.⁴ Over time, chronic hepatitis B can result in liver disease, cirrhosis, or cancer. Each year approximately 3,000 people die from causes related to hepatitis B in the U.S.⁵

The surveillance case definition for chronic hepatitis B infection can be found at:

<http://wwwn.cdc.gov/NNDSS/script/conditionsummary.aspx?CondID=81>

Perinatal Hepatitis B Infection

Perinatal hepatitis B Infection is defined as HBsAg positivity in any infant aged >1-24 months who was born in the United States or in U.S. territories to an HBsAg-positive mother. The Viral Hepatitis Program at CDPHE follows all women 14-45 years of age to determine whether or not they are pregnant. If the woman is pregnant, she is enrolled in the Perinatal Hepatitis B Prevention Case Management Program.

Hepatitis B Morbidity

Surveillance Summary for Hepatitis B

In 2013, a total of 26 cases of acute hepatitis B and 511 cases of chronic hepatitis B were reported in Colorado; 7 cases of acute hepatitis B and 81 cases of chronic hepatitis B were reported in Denver County, Colorado. From 2008-2013, a total of 201 cases of acute hepatitis B and 3,178 cases of chronic hepatitis B were reported in Colorado; 49 cases of acute hepatitis B and 663 cases of chronic hepatitis B were reported in Denver County, Colorado. Table 1 describes the distribution of reported cases by case status, gender, age, race/ethnicity, for 2013 and Table 2 describes the same variables for 2008-2013. Figure 1 displays the total number of cases, acute cases, and chronic cases of hepatitis B over the time period of 2008-2013 in Denver County. Figure 2 displays the rate of total hepatitis B cases per 100,000 population in Denver County. Rates per 100,000 were calculated using 2013-based estimates from the Demographer's Office, Colorado Department of Local Affairs.⁶ Rates include acute and chronic case reports even though up to 10% of acute cases may also be included in the chronic cases. This occurs when an individual retests positive six months following the initial acute diagnosis, and the person is reported as a chronic case following the second test.

Gender

In 2013, among the acute cases, 6 (85.7%) were reported in men and 1 (14.3%) in women (Table 2). For chronic infections, over half of the total 81 reported cases were among men (n=47;58.0%), while 34 (42.0%) were reported in women. Surveillance cannot determine the number of men and women tested in Colorado. From 2008-2013, acute hepatitis B cases for men (n=40, 81.6%) outnumbered women (n=9, 18.4%) in Denver County. The results were similar among chronic hepatitis B cases for women (n=280, 42.2%) and men (n=383, 57.8%). However, Colorado birth certificate data for 2013 reported that 96.1% (65,519) of women were screened for hepatitis B during pregnancy as recommended by the Advisory Committee on Immunization practices of the U.S. Centers for Disease Control and Prevention and the U.S. Preventive Services Taskforce. There is no recommendation to routinely test men. Figure 3 displays the total number of cases of hepatitis B by gender during 2008-2013 in Denver County.

Age

Tables 1 and 2 and Figure 4 display the age distribution of acute and chronic hepatitis B cases in Denver County. In 2013, most reported chronic infections occurred among persons 30-39 (n=25, 30.9%). For the time period of 2008-2013, most chronic infections were also in the 30-39 age group (n=183, 27.6%). Persons older than 27 years of age are less likely to be immunized for hepatitis B based on a school-entry requirement that began in 1997. The higher incidence of acute infections in people over 27 suggests that individuals in these age groups continue to engage in high risk behavior and could benefit from vaccine. Chronic infections are more likely to be diagnosed later in the course of infection when symptoms commonly appear or among women screened during pregnancy.

Race/ethnicity

In Denver County in 2013, the majority of chronic cases of hepatitis B were reported among Asian/Pacific Islander (n=28; 34.6%). Similarly, from 2008-2013, the highest number of chronic hepatitis B infections were reported among Asian/Pacific Islanders (n=249; 37.6%). Rates per 100,000 were calculated using the 2013 estimates from the U.S. Census Bureau, Population Division. Data from Colorado's Perinatal Hepatitis B Unit indicate that foreign-born pregnant women are significantly more likely to be reported with hepatitis B infection than pregnant women born in the U.S. National data also describes significant disparities in chronic hepatitis B infections by race.⁷ Figure 5 illustrates the disproportionate hepatitis B disparity among the Asian/Pacific Islander population in Denver County

from 2008-2013. Other ethnic groups that shared the burden in Denver County include Other ethnicities (n=148, 22.3%), Black non-Hispanic (n=142, 21.4%), White non-Hispanic (n=95, 14.3%), and Hispanic (n=28, 4.2%).

Risk Factors

A subset of risk factor data is included in Tables 3 and 4. These data include: injection drug use (IDU), household contact of known or suspected case, sex contact of known or expected case, men who have sex with men (MSM), and born in an endemic country. These data were obtained through patient interviews, medical record reviews, or from information provided by a physician, hospital, or other healthcare provider. The VHP collected risk factor information on 19 (73.1%) acute HBV cases and 335 (73.1%) chronic HBV cases.

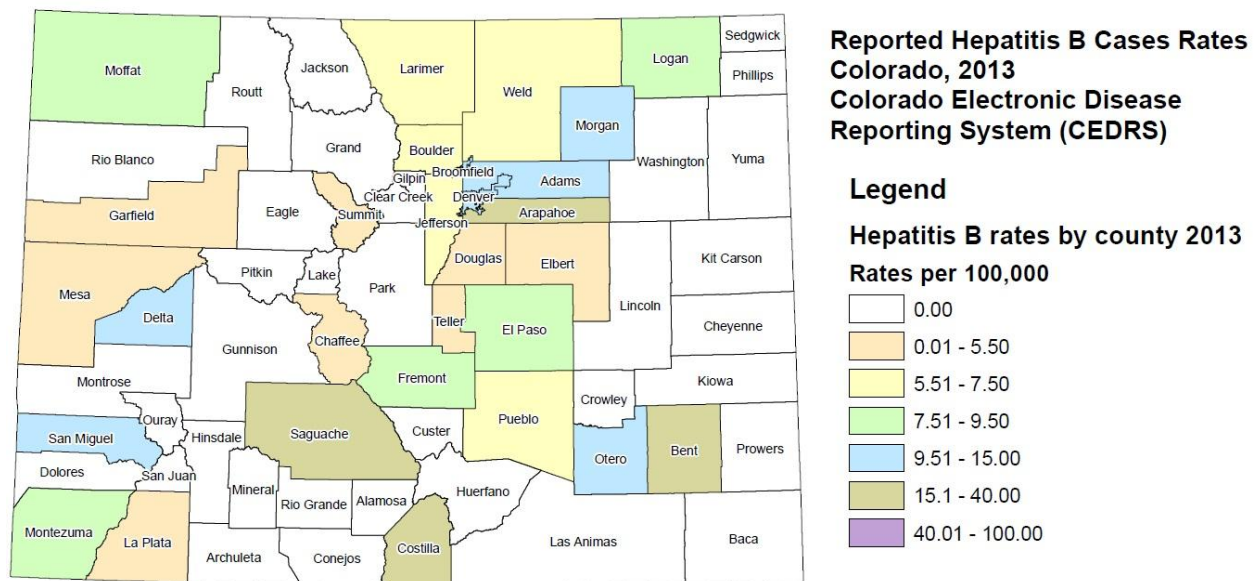


Figure 6. This is a map describing the rate distribution of hepatitis B per 100,000 county populations in Colorado. The rate is calculated using the estimated 2013 census figures from the U.S. Census Bureau, Population Division.⁸

References

¹ Population figures for 2000-2013 are 2013-based estimates from the Demographer's Office, Colorado Department of Local Affairs.

² Denver Regional Council of Governments-Denver County Community Profile.
<http://gis.drcog.org/datacatalog/sites/default/files/Denver%20City%20County.pdf>

³ U.S Census Bureau, State and County Quick Facts-Denver County, Colorado 2013
<http://quickfacts.census.gov/qfd/states/08/08031.html>

⁴ World Health Organization. (July 2012). Hepatitis B: Fact Sheet No. 204. Retrieved from
<http://www.who.int/mediacentre/factsheets/fs204/en/>

⁵ Centers for Disease Control and Prevention. (2010). Disease Burden from Viral Hepatitis A, B, and C in the United States.
Retrieved from http://www.cdc.gov/hepatitis/pdfs/disease_burden.pdf

⁶ US Census Bureau, Population Division. (June 2013). Annual Estimates of the Resident Population by Sex, Age, Race, and Hispanic Origin for the United States and States: April 1, 2010 to July 1, 2012. Retrieved from
<http://www.census.gov/popest/data/index.html>.

⁷ McQuillan, G.M, Kruszon-Moran, D, Denniston, M.M, & Hirsch, R. (March 2010). Viral Hepatitis. NCHS Data Brief 27. Retrieved from
<http://www.cdc.gov/nchs/data/databriefs/db27.htm>.

⁸ US Census Bureau, Population Division. (June 2014). Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2013. Retrieved from <http://www.census.gov/popest/data/index.html>.